RINGKASAN

ADITYA CANDRALESMANA. Penelitian berjudul "Suplementasi Ekstrak Daun Sirih Merah (*Piper crocatum*) Pada Pakan Sapi Potong Terhadap Produksi Gas Total Dan Gas Metan (CH_4) Secara *In Vitro* ", telah dilaksanakan tanggal 1 Januari sampai 26 Januari 2016 di Laboratorium Ilmu Bahan Makanan Ternak Universitas Jenderal Soedirman Purwokerto. Tujuan penelitian ini adalah mengkaji pengaruh dan efisiensi suplementasi ekstrak daun Sirih Merah (*Piper crocatum*) dalam pakan sapi potong terhadap produksi gas total dan gas metan secara *in vitro*.

Materi yang digunakan dalam penelitian ini adalah pakan basal sapi potong yang terdiri atas rumput gajah 70 % dan konsentrat 30 % dengan kandungan protein kasar (PK) 9,3%; serat kasar (SK) 21,11% dan *Total Digestible Nutrient* (TDN) 64,9%, cairan rumen sapi potong, ekstrak daun Sirih Merah (*Piper crocatum*), seperangkat alat perhitungan gas total dan gas metan secara *in vitro*. Metode penelitian adalah eksperimental menggunakan Rancangan Acak Lengkap (RAL). Perlakuan yang uji cobakan yaitu R1:Pakan Basal, R2 : R1 + 15 ppm ekstrak sirih merah (*Piper crocatum*), R3: R1 + 30 ppm ekstrak sirih merah (*Piper crocatum*), R4: R1 + 45 ppm ekstrak sirih merah (*Piper crocatum*), R5: R1 + 60 ppm ekstrak sirih merah (*Piper crocatum*). Data dianalisis menggunakan analisis variansi dan dilanjutkan uji Ortogonal Polynomial.

Hasil penelitian menunjukkan bahwa rataan produksi gas total R_1, R_2, R_3, R_4 dan R_5 berturut-turut adalah 12,350 ± 0,71 ml/g pakan, 12.300 ± 0,46 ml/g pakan, 12,200 ± 1,38 ml/g pakan, 13,275 ± 1,32 ml/g pakan dan 12,625 ± 1,08 ml/g pakan. Sedangkan rataan produksi gas metan R_1, R_2, R_3, R_4 dan R_5 berturut-turut adalah 6.55 ± 0.71 ml/g pakan, 5.70 ± 0,46 ml/g pakan, 6.07 ± 1,38 ml/g pakan, 6,50 ± 1,32 ml/g pakan dan 6,10 ± 1,08 ml/g pakan. Hasil penelitian menunjukan bahwa perlakuan berpengaruh terhadap penurunan produksi gas metan ($P< 0,05$). Hasil Uji Ortogonal Polynomial menunjukkan bahwa kurva respon pengaruh suplementasi ekstrak sirih merah (*Piper crocatum*) terhadap produksi produksi gas total dan gas metan berbentuk kubik, dengan suplementasi ekstrak sirih merah

(*Piper crocatum*) optimum gas metan pada level 15 ppm. Berdasarkan titik puncak produksi gas total dan gas metan dengan waktu fermentasi 48 jam menunjukan jam 21 adalah titik puncak produksi gas total dan gas metan.

SUMMARY

ADITYA CANDRALESMANA. A research entitled " Supplementation of Red Betel (*Piper crocatum*) Extracts on Beef Cattle Feed its effect Total Gas Production and Methan Production (CH_4) by *in vitro*", was held from January 1st to January 26th, 2016 in Laboratory of Animal Feed Stuff, Animal Science Faculty, Jendral Soedirman University, Purwokerto. The aim of this study was to assess the impact and efficiency supplementation of red betel (*Piper crocatum*) extracts on beef cattle diet on total gas production and methan production effect (CH_4) by *in vitro.*

The materials of the research were basalt feed beef cattle consist of forage 30% dan concentrate 70% by content crude protein (CP) 9,3%; crude fiber (CF) 21,11% dan *Total Digestible Nutrient* (TDN) 64,9%, rumen fluid, red betel (*Piper crocatum*) extracts , a set tools of calculation total gas production and methan production (CH_4) by *in vitro*. The research method was experimentally is using completely randomized design (CRD).. The treatments tested were R1: Basalt Feedl, R2 : R1 + 15 ppm oof red betel (*Piper crocatum*) extract, R3: R1 + 30 ppm of red betel (*Piper crocatum*) extract, R4: R1 + 45 ppm of red betel (*Piper crocatum*) extract, R5: R1 + 60 ppm of red betel (*Piper crocatum*) extract. The data were analyzed using analysis of variance followed by Orthogonal Polynomial.

The results showed that the average of total gas production R_1, R_2, R_3, R_4 and R_5 were 12,350 ± 0,71 ml/g of feed, 12.300 ± 0,46 ml/g of feed, 12,200 ± 1,38 ml/g of feed, 13,275 ± 1,32 ml/g of feed and 12,625 ± 1,08 ml/g of feed. While the average of methane gas production R_1, R_2, R_3, R_4 and R_5 were 6.55 ± 0.71 ml/g of feed, 5.70 ± 0,46 ml/g of feed, 6.07 ± 1,38 ml/g of feed, 6,50 ± 1,32 ml/g of feed dan 6,10 ± 1,08 ml/g of feed. The result showed that treatment decreased methane production (P> 0,05). The result test Polynomial Ortogonal showed difference significant on effect responses curve supplementation of red betel (*Piper crocatum*) extracts its effect methane gas production organized as cubik, with supplementation of red betel (*Piper crocatum*) extracts optimum on methane production level 15 ppm. Grounded on flap point total gas production and methan

production by time fermentation 48 hour showed point of 21 hour as flap point total gas production and methane production.